

Claims

1. A brake transmission shift interlock actuator, comprising:
 - a bobbin defining an open end;
 - a plunger slidably disposed within the bobbin;
 - a plunger rod extending from the plunger;
 - a primary plate installed within the open end of the bobbin;

and

wherein a magnetic force of attraction between the plunger and the primary plate diminishes as the plunger approaches the primary plate.
2. The actuator of Claim 1, wherein the plunger is movable between an unlocked position, wherein the plunger rod does not extend through the primary plate and a locked position, wherein at least a first end of the plunger rod extends through a bore formed by the primary plate.
3. The actuator of Claim 2, wherein the bobbin defines a closed end, the closed end of the bobbin comprising:
 - a pocket; and
 - plural ribs extending radially into the pocket.

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4. The actuator of Claim 3, wherein the plunger rod defines a second end that extends beyond the plunger, the second end of the plunger rod abutting the closed end of the bobbin when the plunger is in the unlocked position.

5. The actuator of Claim 4, further comprising:
an O-ring damper support face established around the outer periphery of the plunger; and
a first O-ring damper disposed around the plunger adjacent to the O-ring damper support face.

6. The actuator of Claim 5, further comprising:
a second O-ring damper disposed around the second end of the plunger rod.

7. The actuator of Claim 6, further comprising:
a spring biasing the plunger from the locked position to the unlocked position.

8. The actuator of Claim 7, wherein the spring is installed in compression between the primary plate and the plunger.

9. An electro-mechanical transmission locking system, comprising:
 - a vehicle power supply;
 - an ignition switch electrically coupled to the vehicle power supply;
 - a brake pedal switch;
 - a brake transmission shift interlock actuator coupled to the ignition switch and the brake pedal switch, the brake transmission shift interlock actuator including a primary plate and a plunger, wherein the plunger moves toward the primary plate when the brake transmission shift interlock actuator is energized, and wherein a magnetic force of attraction between the plunger and the primary plate diminishes as the plunger approaches the primary plate;
 - a transmission shift lever mechanically coupled to the brake transmission shift interlock actuator; and
 - an automatic transmission mechanically coupled to the transmission shift lever.

10. The system of Claim 9, wherein the brake transmission shift interlock actuator comprises:

a bobbin defining an open end;

a plunger slidably disposed within the bobbin;
a plunger rod extending from the plunger; and
a primary plate installed within the open end of the bobbin.

11. The system of Claim 10, wherein the plunger is movable between an unlocked position, wherein the plunger rod does not extend through the primary plate and a locked position, wherein at least a first end of the plunger rod extends through a bore formed by the primary plate to prevent the transmission shift lever from moving.

12. The system of Claim 11, wherein the bobbin defines a closed end, the closed end of the bobbin comprising:
a pocket; and
plural ribs extending radially into the pocket.

13. The system of Claim 12, wherein the plunger rod defines a second end that extends beyond the plunger, the second end of the plunger rod abutting the closed end of the bobbin when the plunger is in the unlocked position.

14. The system of Claim 13, further comprising:

an O-ring damper support face established around the outer periphery of the plunger; and
a first O-ring damper disposed around the plunger adjacent to the O-ring damper support face.

15. The system of Claim 14, further comprising:
a second O-ring damper disposed around the second end of the plunger rod.
16. The system of Claim 15, further comprising:
a spring biasing the plunger from the locked position to the unlocked position.
17. The system of Claim 16, wherein the spring is installed in compression between the primary plate and the plunger.
18. A brake transmission shift interlock actuator, comprising:
a plunger; and
a primary plate; and
wherein the plunger moves toward the primary plate when the actuator is energized and wherein a magnetic force of attraction

between the plunger and the primary plate diminishes as the plunger approaches the primary plate.

19. The actuator of Claim 18, further comprising:
 - a plunger rod extending from the plunger;
 - a bobbin defining an open end;
 - wherein the plunger is slidably disposed within the bobbin;and
 - wherein the primary plate installed within the open end of the bobbin.

20. The actuator of Claim 19, wherein the plunger is movable between an unlocked position, wherein the plunger rod does not extend through the primary plate and a locked position, wherein at least a first end of the plunger rod extends through a bore formed by the primary plate.

21. The actuator of Claim 20, wherein the bobbin defines a closed end, the closed end of the bobbin comprising:
 - a pocket; and
 - plural ribs extending radially into the pocket.

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22. The actuator of Claim 21, wherein the plunger rod defines a second end that extends beyond the plunger, the second end of the plunger rod abutting the closed end of the bobbin when the plunger is in the unlocked position.

23. The actuator of Claim 22, further comprising:
an O-ring damper support face established around the outer periphery of the plunger; and
a first O-ring damper disposed around the plunger adjacent to the O-ring damper support face.

24. The actuator of Claim 23, further comprising:
a second O-ring damper disposed around the second end of the plunger rod.

25. The actuator of Claim 24, further comprising:
a spring biasing the plunger from the locked position to the unlocked position.

26. The actuator of Claim 25, wherein the spring is installed in compression between the primary plate and the plunger.